

REMARKS

These amendments and remarks attend to all issues presented in the Office Action mailed 5 October 2007. Claims 1, 3-8, 15-20 and 22-28 are pending in the application, with claims 1-7 and 15 considered withdrawn from consideration.

Claim 2 has been cancelled. Claim 8 has been amended to incorporate subject matter disclosed in claims 20 and 21. Claim 21 is presently cancelled. Claims 23-28 are newly added. New claim 23 finds support, for example, in original claims 1, 6 and 15. Claims 24 and 27 find support throughout the specification and in FIGS. 1, 2 and 5, for example. Claim 25 finds support, for example, in paragraph [0028] and FIG. 2. Claim 26 finds support, for example, in paragraph [0043]. Claim 28 finds support in original claim 18, for example. No new matter has been added to the claims by these amendments.

The specification has been amended at pp. 5-6, [0021]-[0022] to remove an extraneous bracket and to state that FIGS. 7A and 7B show pulse sequences with motion encoding gradients, which differ from one another as being positive in one case and negative in the other. Support for this amendment may be found, for example, at p. 18, [0057] which describes items 702 and 704 as motion encoding gradients. No new matter has been added to the specification by these amendments.

Election/Restriction

All pending claims are readable upon the subject matter elected for prosecution in the response to the restriction requirement filed August 14, 2006, namely, “systems and methods for encoding motion in a subject”.

Claim Rejections – 35 U.S.C. § 112

Independent claims 8 and 22 and dependent claims 16-21 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner states, “[t]here is simply, no description...pertaining to the step of removing any component of the imaging gradient that encodes motion by oscillating at a regular frequency. The examiner has reviewed the whole specification anew and cannot find

support for this step in any other place not indicated by applicant. Moreover, the drawings which applicant also point to as providing support for this limitation, contradict the limitation. Gradient components 612, 702 and 714 appear to oscillate at a regular frequency.” (Office Action of 5 October 2007, p. 3)

Although the terminology at issue has been removed from claims 8 and 22, thereby rendering this rejection moot, Applicants submit the following remarks to clarify the record.

The present specification discusses imaging gradients, which encode spatial information in the x - and y -directions for a given image slice along the z -axis, and motion encoding gradients, which encode motion of the tissue. The imaging gradients are sometimes referred to as phase-encoding gradients or frequency-encoding gradients, as is common for MR imaging.

Traditional MRE methods ‘employ separate *motion* encoding gradients to accumulate the phase in each voxel’, which reflects the amplitude (and phase) of the motion (p. 2, [0005]-[0006]). However, the present systems and methods utilize “one or more *imaging* gradient waveforms to identify motion of the specimen...[and] echo times are advantageously reduced because the imaging gradients encode a harmonic motion, as opposed to separate motion-encoding gradients.” (p. 4, [0012]). “The echo time is reduced substantially by *removing the motion encoding gradients* and the total imaging time is also reduced.” (p. 19, [0059])

FIGS. 6 and 7, which are cited by the Examiner, relate to “standard” and “normal” pulse sequences that include motion encoding gradients, e.g., 612, 702 and 704, and demonstrate phase cycling of motion encoding gradients. As discussed above, and shown in FIGS. 8 and 9, separate motion encoding gradients are removed from the presently disclosed pulse sequences.

Conclusion

In view of the these Amendments and Remarks, Applicants have addressed all issues raised in the Office Action dated 5 October 2007. Should any issues remain, the Examiner is encouraged to telephone the undersigned.

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Authorization to charge fees associated with a Request for Continued Examination and a one-month extension of time is submitted herewith. Applicants previously paid for 20 total claims and 6 independent claims, which is consistent with the present claim count. It is believed that no additional claim fees are required in conjunction with the filing of this Amendment and Response. If, however, any additional fee is deemed necessary in connection with this Response, please charge Deposit Account No. 12-0600.

Respectfully submitted,

LATHROP & GAGE L.C.

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By: Shireen Marshall
Shireen Marshall, Reg. No. 54,295
4845 Pearl East Circle, Suite 300
Boulder, Colorado 80301
Tele: (720) 931-3031
Fax: (720) 931-3001